IN THE CLAIMS

Please amend the claims as follows:

Claims 1-18 (Canceled).

Claim 19 (Previously Presented): A multi-user detection method that eliminates interference between users, each user transmitting a signal of modulated data in a form of symbols on a transmission channel, each transmission channel including at least one propagation path and each propagation path arriving at an array of reception antennas in a direction of arrival, the method comprising:

executing at least one sequence for each user, each sequence comprising:

(a) estimating the signal transmitted by the user from signals received at antennas, the estimating (a) effecting an estimation of a direction of arrival and characteristics of propagation of each path of the transmission channel from the signals;

(b) estimating the data transmitted by the user from the estimation of the signal transmitted;

(c) estimating a contribution of the user to the signals received by the different antennas from the data estimated at the estimating (b) and the direction of arrival and the propagation characteristics estimated at the estimating (a); and

(d) subtracting from the signals the contribution estimated at the estimating (c) to obtain cleaned antenna signals, the cleaned antenna signals supplied by at least a first sequence being used as antenna signals by at least a second sequence.

Claim 20 (Previously Presented): A multi-user detection method according to claim 19, wherein, for a given user, the interference is eliminated by subtracting from the antenna signals the contributions of all the other users.

Claim 21 (Previously Presented): A multi-user detection method according to claim 19, wherein the users are classified by order of power received and the interference is eliminated by subtracting one after the other the contributions of the different users commencing with the users with the highest powers received.

Claim 22 (Previously Presented): A multi-user detection method according to claim 19, wherein, for each user, the sequence comprises, after the estimating (b) the data, a deinterleaving followed by a channel decoding, a channel coding, and interleaving the data.

Claim 23 (Currently Amended): A multi-user detection method according to ~~claims~~ claim 19, wherein, for each user, the sequence comprises, prior to the estimating (c) the contribution of the user to the received signals, modulation and spectral respreading by the signal that was used to spectrally spread the symbols of the user.

Claim 24 (Currently Amended): A multi-user detection method according to ~~claims~~ claim 23, wherein, the estimating (a) of the transmitted signals of the users utilizes an ~~estimations~~ estimation vector with K components, in which K is a number of users, the ~~estimations~~ estimation vector being subjected to a transverse matrix filtering.

Claim 25 (Currently Amended): A multi-user detection method according to claim 24, wherein the estimated ~~and remodulated~~ data transmitted by ~~of~~ the users ~~is~~ comprises a

vector of symbols with K components, the vector of symbols being subjected to a postcursor matrix filtering and an output of this filtering is subtracted, vector by vector, from an output of the transverse matrix filtering.

Claim 26 (Currently Amended): A multi-user detection method according to claim 24, wherein the symbols issuing from the modulation are ~~a~~ symbols vector with K components, the symbols vector being subjected to a postcursor matrix filtering, and an output of this filtering is subtracted, vector by vector, from an output of the transverse matrix filtering.

Claim 27 (Previously Presented): A multi-user detection method according to claim 22, wherein the estimating (a) the signals transmitted by the different users is subjected to a matrix multiplication by a matrix $(F^T)^{-1}$ before the data estimating (b), where F^T is transpose of a lower triangular matrix F obtained by Cholesky decomposition of a signature correlation matrix that was used to spectrally spread the symbols of the users, the interference being eliminated, for a given user k, in a first phase, by subtracting from the k^{th} component of the matrix product sum $\sum_{i=1}^{k-1} Ai,Fk,i,\hat{S}i$, in which A_i is amplitude of the signal transmitted by the user i, $\hat{S}i$ is the symbol obtained by remodulation of the estimated data of the user i, and $F_{k,i}$ is the (k,i)th element of the matrix F, the estimating (a) the data transmitted by the user k being effected from the k^{th} component after the subtraction and, in a second phase, by subtracting, from the signals received by the different antennas, a sum of contributions of all the other users.

Claim 28 (Currently Amended): A multi-user detection method according to claim 19, wherein, for each user k, the estimating (a) the signal transmitted by the user, on the

transmission channel, comprises ~~a formation of~~ forming channels in the directions of arrival of the different propagation paths ~~of the channel~~.

Claim 29 (Currently Amended): A multi-user detection method according to claim 28, wherein the channel formation for a propagation path of a transmission channel ~~can place~~ places zeros in the directions of arrival of other propagation paths of the same transmission channel.

Claim 30 (Currently Amended): A multi-user detection method according to claim 29, wherein the channel formation for a propagation path of a transmission channel ~~can~~ also ~~place~~ places zeros in the directions of arrival of all the propagations paths of the other transmission channels.

Claim 31 (Previously Presented): A multi-user detection method according to claim 28, wherein, for each transmission channel, results of formation of channels are weighted by complex coefficients and are then summed, the coefficients being obtained from the estimated propagation characteristics of the different paths of the transmission channel.

Claim 32 (Previously Presented): A multi-user detection method according to claim 19, wherein, for each user, the directions of arrival and the propagation characteristics of the different paths are estimated from a priori knowledge of a symbol transmitted by the user.

Claim 33 (Currently Amended): A multi-user detection method according to claim 32, further comprising an iteration of a set of the sequences, each sequence of a user of a

second iteration and following iterations operating on the set of antenna signals where the contributions of the other users have been eliminated at the previous iteration.

Claim 34 (Previously Presented): A multi-user detection method according to claim 33, wherein, at the first iteration, for each user, the directions of arrival and the propagation characteristics of the different paths are estimated from a priori knowledge of at least one pilot symbol transmitted by the user and, at subsequent iterations, the estimating is effected from at least one data item estimated and remodulated at a previous iteration in addition to the pilot symbol.

Claim 35 (Previously Presented): A multi-user detection method according to claim 33, wherein, the propagation characteristics of the different paths being known a priori, the first iteration operates without channel formation, in omni-directional mode, the channel formation being applied as from the second iteration.

Claim 36 (Canceled).